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WILL FERTILITY REBOUND IN JAPAN?*[∞]

Creina Day§

ABSTRACT

Fertility and per capita income are now positively associated across most high income OECD countries. Low fertility and a gender wage gap persist in Japan. This paper presents an original model where endogenous increases in childcare prices and gender equity in capital allocation play important roles in the effect of per capita income growth and rising female relative wages on fertility. Results suggest Japan has cause for optimism. Economic growth will raise female relative wages where capital is equitably allocated in the workforce. In turn, rising female relative wages will sustain a fertility rebound where childcare productivity is sufficiently high.

Keywords: fertility; economic growth; gender wage gap; endogenous child-care

JEL Classification: J13; J24; 040

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I Introduction

At 1.39 births per woman, Japan's total fertility rate in 2010 remains among the lowest in the developed world. If current trends continue, Japan's population is expected to shrink by one third in 50 years (United Nations, 2011). However, these projections are not a foregone conclusion. They are especially sensitive to assumptions about the future course of fertility (United Nations, 2011).

Interest in the question of whether fertility will rebound in Japan is sparked by the fact that we are currently witnessing a fundamental change in the relationship between fertility and economic development. On the basis of cross-sectional and longitudinal data covering more than 100 countries, Myrskyla et al (2009) find that the well established negative relationship between fertility and development now resembles a J at advanced stages of development. In 2005, as countries progress to Human Development Index (HDI) levels exceeding 0.9[1], the HDI-fertility association reverses to a positive relationship.

[1]The HDI is an index, primarily used by the United Nations to evaluate development, which combines with equal weight indicators of a country's health conditions, standard of living and human capital. For most OECD economies, HDI levels exceed 0.9, which corresponds to 75 years life expectancy, per capita Gross Domestic Product (GDP) US$25,000 in year 2000 PPP and a 0.95 human capital index (based on literacy and enrolment rates).

[Figure 1 about here]

Figure 1 shows the reversal in fertility decline for a sample of developed economies where total fertility rates are climbing back to replacement - the level at which enough children are born to replace their parents. This reversal in trend is pervasive across high income OECD countries and raises two questions. First, is the fertility rebound likely to be sustained? Second, why has low fertility persisted in some countries, such as Japan? These questions have relevance and importance for the debate on ageing population and associated immigration and pro-natalist policies.

HDI does not reveal information on how its components of per capita GDP, education and longevity interrelate or aspects of development which benefit women rather than men. The objective of this paper is to re-examine the theoretical relationship between fertility, female wages relative to male wages and per capita GDP in light of recent evidence and, in doing so, shed light on the prospect of a fertility rebound in Japan.

Galor and Weil (1996) show that female wages rise relative to male wages with per capita GDP because men and women are endowed with different labour. The rising opportunity cost of maternal time induces fertility decline since only time is used to rear children. Apps and Rees (2004), Day (2004) and Martinez and Iza (2004) show that rising female relative wages may induce a rise in fertility if households can substitute child care for maternal time. However, the price of child care is fixed in these models. This is a shortcoming when assessing whether a fertility rebound is likely to persist, since increased demand may raise the price of child care.

In contrast to the existing literature, this paper analyses whether a positive impact of female relative wages on fertility can be sustained as rising demand for children puts pressure on child care prices to rise and whether female relative wages necessarily rise with per capita GDP. Whether a fertility rise can be sustained rests on the relative rise in child care prices. Why Japan, with high per capita GDP, is yet to experience a fertility rebound may depend on whether growth in per capita GDP filters through to higher female relative wages.

To the best of my knowledge, this is the first paper to model the effect of rising female relative wages on fertility with endogenous increases in the price of child care and to link rising female relative wages to gender differences in not only labour endowments but also capital allocations in the workforce. These extensions enable us to assess both the robustness of an emerging positive relationship between fertility and per capita GDP witnessed in most OECD economies and the persistence of low fertility in Japan.

Two particularly interesting results of the model presented in this paper are, firstly,

that fertility of households purchasing child care rises with female relative wages despite endogenous increases in child care prices, however, a positive relationship between overall fertility and female relative wages is not robust. Secondly, economic growth may not raise female relative wages if, relative to women, men work with increasing capital. These results have a wide range of implications for the role of gender equity, child care policy and the use of current fertility trajectories in formulating population projections.

Section II reports on some empirical facts concerning total fertility rates, per capita GDP and the gender wage gap in OECD countries and reviews related models of endogenous fertility in light of these facts. Section III provides a theoretical framework capable of analysing the effect of female relative wages on fertility, with an endogenously determined market price of child-care. Section IV relates the results of the theoretical modelling to recent trends in Japanese female relative wages and discusses why a gender wage gap may persist, despite growth in per capita GDP.

II Facts and Review of Related Models

Endogenous fertility models explain growth in per capita GDP as a cause and consequence of household choice of fertility. This section singles out the association between per capita GDP and fertility, which provides a useful platform for developing a theoretical model. Endogenous fertility models recognise that the opportunity cost of maternal time influences household fertility choice. This section therefore also examines the role of gender wages.

[Figure 2 and 3 about here]

Observation 1 *The once strictly negative cross-country association between fertility and per capita GDP has become positive for most OECD economies with high levels of per capita GDP.*

Figures 2 and 3 depict the once strictly negative and emerging positive cross country correlation between fertility and per capita GDP, respectively. The correlation suggests the emergence of a relationship that is convex across all OECD economies and positive for most OECD economies with high per capita GDP. Of course, we would need to control for cross country heterogeneity. Luci and Thevenon (2010) do this and confirm a convex impact of per capita income on fertility, for OECD economies, after controlling for birth postponement and country specific effects.[2] Some outliers are worth mentioning. Higher fertility in the United States and New Zealand is partly due to Hispanic populations, religious and ethnic diversity, and Maori populations, respectively (McDonald, 2009).

Referring to Figure 3, Japan and Germany have much lower fertility than France, Australia and Finland despite having similar living standards. Figure 4 suggests a possible explanation as to why Japan may be at the bottom rather than the top of the steep positive association between fertility and per capita GDP. In Japan, female wages are roughly one third of male wages, almost twice the OECD average gender wage gap of 17.6 per cent. This gives us

Observation 2 *OECD economies with the highest gender wage gap (lowest female relative wages) have the lowest fertility.*

Existing models of endogenous fertility predict that economic growth induces fertility decline, by raising either female relative wages, and hence the opportunity cost of maternal time, (Barro and Becker, 1989; Galor and Weil, 1996), the relative return to investing in education per child (Becker et al., 1990; Ehrlich and Lui, 1991; Galor and Weil, 2000; de la Croix and Doepke, 2003; Lee and Mason, 2010)

[2]Although timing and policy effects do not explain the positive association, developing the model in this paper along the lines of Guest and Parr (2010) is a feasible direction for future research.

or the fraction of skilled workers, who have fewer children than their unskilled counterparts (Dahan and Tsiddon, 1998; Kremer and Chen, 2002; Kimura and Yasui, 2007; Sato et al, 2008, Chen, 2010).

In the main, endogenous fertility models predict an unambiguously negative interrelationship between per capita GDP and fertility for high income economies. However, Apps and Rees (2004) and Day (2004) extend Galor and Weil (1996) to show that fertility may rise with female wages and female relative wages, respectively, if there is sufficient substitutability in rearing children between maternal time and child-care services. Intuitively, substitution to child care enables households to mitigate the rising opportunity cost of unpaid maternal time, which underpins fertility decline.

[Figure 4 about here]

By normalising the price of child care to 1, both models implicitly fix the relative price of child care. A fixed price of child care is in fact an assumption common to models where child care is a substitute for maternal time (Martinez and Iza, 2004; Hirazawa and Yakita, 2009). Martinez and Iza (2004) incorporate a child care sector, thereby endogenising the price of child care. However, their assumption that child care uses unskilled labour yields a constant price of child care.

Yasuoka and Miyake (2010) introduce Martinez and Iza's (2004) child care market to the model of de la Croix and Doepke (2003), where households choose the number and education level of children. Since labour is skilled, the price of child care rises proportional to the average level of education. The assumption that households do not comprise men and women yields tractable analysis. However, like per capita income, average education levels in the low fertility countries, such as Japan and Korea, are similar to those in the higher fertility OECD countries.[3] Observation 2 suggests that a model be developed along the lines of Galor and Weil (1996) where the gender wage gap plays a role in fertility choice. Overlooked in the existing literature is the effect of female relative wages on fertility under endogenous child care prices.

This paper further extends the literature by considering herein that the price of child care is given by equilibrium in the market for child care services which employs skilled female labour. We find Martinez and Iza's (2004) model of the child care sector to be a useful starting point for the analysis in this paper, which focuses on whether a positive relationship between fertility and female relative

[3]For example, average years of schooling of the population aged 15-64 in 2010 is 13.25, 13.34 and 13.11, 13.34 in Japan, Korea and Australia, UK, respectively (Cohen and Soto, 2007).

wages can be sustained as rising demand for child care puts pressure on child care prices to rise.

In the following section, like Martinez and Iza (2004) we assume that market provided child care and maternal time are perfect substitutes and take the division of labour exogenously. In Section IV, like Galor and Weil (1996), we explain why female wages are lower than male wages, which gives the division of labour.

III The Model

Consider an economy where agents supply labour, consume and use either maternal time or purchased child care to rear children. Our basic unit of analysis is the couple and they are assumed to be together from birth, as in Galor and Weil (1996). The household, headed by a man and a woman with joint consumption and utility, decides how many children to have and whether to rear children using maternal time or purchased child care.

(i) Household optimisation

Each agent (household) derives utility directly from the number of children. The household utility function is

$$u = \gamma \ln n + (1-\gamma)\ln c \tag{1}$$

Where c and n denote household consumption and pairs of children, respectively; $\gamma \in (0,1)$ captures the relative preference for children.

Each man and woman is endowed with a unit of time. Men allocate their unit time endowment to the paid labour force. To raise a pair of children, women may employ a fraction of their time endowment, $\hat{z} \in (0,1)$, in which case their paid labour supply is $(1-\hat{z}n)$. Alternatively, women may buy out their unpaid time in child-rearing for a child care fee, P, thereby raising their paid labour supply to 1 .

The budget constraint of a household not purchasing child care is

$$(1-m)w^f \hat{z}n + c(1-\tau) = w^m + w^f \tag{2}$$

Where m is the rate of maternity pay and consumption is taxed at the rate of τ. Alternatively, the household may pay a fee of P, subsidised at the rate β, to use child care services. Specifically, if $(1-m)w^f \hat{z} \geq P(1-\beta)$ the household budget constraint changes to

$$P(1-\beta)n + c(1-\tau) = w^m + w^f \tag{3}$$

Each household chooses n and c to maximise (1) subject to (2) or (3), yielding

$$n^x = \frac{\gamma(w^m + w^f)}{(1-m)w^f \hat{z}} \text{ if } (1-m)w^f \hat{z} < P(1-\beta) \tag{4a}$$

$$n^y = \frac{\gamma\left(w^m + w^f\right)}{P(1-\beta)} \text{ if } (1-m)w^f \hat{z} \geq P(1-\beta) \tag{4b}$$

and $c^i = \alpha(w^m + w^f)/(1-\tau)$ where $i = x, y$ denotes a household using maternal time or buying child care, respectively.

Remark 1 *As male and female wages rise, with female wages rising relative to male wages, fertility of a household using maternal time and child care, declines and rises, respectively, for a given price of child care.*

From (4),

$$d \ln n^x\big|_{\overline{m}} = \frac{w^m}{(w^m + w^f)}\left[d \ln w^m - d \ln w^f\right] < 0$$

$$d \ln n^y\big|_{\overline{P},\overline{\beta}} = \frac{\left[w^m d \ln w^m + w^f d \ln w^f\right]}{(w^m + w^f)} > 0$$

The intuitive explanation for the differential fertility response lies in a comparison of substitution and income effects. When both husband and wife work, female wages constitute a portion of household income. When maternal time is the child-rearing input, the cost of child-rearing rises proportionate to female wages. As female relative wages rise, the substitution effect dominates the income effect and fertility declines. When purchased child care is the child-rearing input, rising female relative wages has a pure income effect, for a given price of child care, and fertility rises.

By implication, the average fertility, which includes households who purchase child care, may increase as female relative wages rise. Thus far the effect of rising female relative wages on fertility has been analysed for a given price of child care services. This paper explores the robustness of a positive relationship between fertility and female relative wages, and so the price of child care is endogenised in a straightforward manner by assuming that child care is produced using a portion of the female labour force and sold at a price is determined by market demand and supply.

(ii) Production of Final Output and Child Care

The production of final goods is given by

$$Y = A(K, L_y^f, L_y^m) \tag{5}$$

where physical or human capital which augments labour (K), female labour employed in the final goods sector (L_y^f) and male labour (L_y^m) are factors of

production, all with non-increasing marginal products and A is a parameter that affects total factor productivity in final goods. Labour is complementary to capital.

Perfectly competitive factor markets imply

$$w_y^j = A\left[g(k) - g'(k)k\right] \tag{6}$$

where $k \equiv K/L$ denotes capital per household and $j = f, m$.

The nexus between rising female relative wage and economic growth is discussed in Section IV. For the moment, note that female wages are lower than male wages. Specifically,

$$w_y^f(k) < w_y^m(k) \tag{7}$$

Whereas men work in the final goods sector, women may work in child care services or final goods sectors.

The production of aggregate child care services is given by

$$X = \rho L_f^x \tag{8}$$

where L_x^f is female labour employed in child care and ρ is a parameter that affects total productivity and also captures quality improvements in the child care sector. The child care sector profit is $\pi = P\rho L_x^f - w_x^f L_x^f$. Under perfect competition, we obtain $w_x^f = \rho P_x$.

(iii) Child Care Market

The aggregate supply of child-care services is

$$\rho L_x^f = \rho\left[\varphi N\left(1 - \hat{z}n^x\right)\right]$$

where N is the aggregate number of households and φ is the fraction of households with women working in child care.

If $w_x^f > w_y^f$ then the woman works in the child care services sector. Alternatively, if $w_x^f < w_y^f$ then the woman works in the final goods sector. Capital augmented labour moves between the two sectors so as to equate wages: $w_x^f = w_y^f$ or $\rho P_t = w^f(\tilde{k})$, where $\tilde{k}$ is the level of capital per household where female labour is employed in both child care and final goods production.

The aggregate demand for child care services is

$$n^y N^y = \frac{\gamma(w^m + w^f)}{P(1-\beta)}(1-\varphi)N$$

where N^y is the number of households with women working in the final goods sector. If $P(1-\beta) < (1-m)w^f(k)\hat{z}$ then the household uses child care services. Alternatively, if $P(1-\beta) > (1-m)w^f(k)\hat{z}$ then the household uses maternal time to rear children. Let $\breve{k}$ denote the level of capital per household where the economy comprises both households using maternal time and buying child care: $P(1-\beta) = (1-m)w^f(\breve{k})\hat{z}$.

If we assume $\rho\hat{z} = (1-\beta)/(1=m)$, for simplicity[4], then we obtain $\tilde{k} = \breve{k}$ and the economy will comprise households of two types, described herein. The economy is populated by women who work in the final goods sector and use child care, and women who work in child care services and use their own time to rear children.

(iv) Equilibrium

The market price of child care services is determined so that demand coincides with supply, yielding

$$P(1-\beta) = \left[\frac{1-\varphi}{\varphi}\right]\frac{\gamma}{(1-\gamma)}\frac{1}{\rho}\frac{\gamma(w^m + w^f)(1-m)}{(1-m-\gamma) - \gamma w^m / w^f} \tag{9}$$

where $w^j(k)$.

P changes in response to market demand and supply forces, to satisfy (9). On the one hand, market demand for child care increases in the income, and fraction of households with women working in final production, $(w^m + w^f)$ and $(1-\varphi)$, respectively, and the preference weight for children, γ. On the other hand, market supply of child care increases in the fraction of households with women working in child care, φ, productivity in the sector, ρ, and labour supply to the sector, which increases in w^f / w^m, since higher female relative wages reduces fertility of women working in child care, freeing up time for paid work. In equilibrium, the sectoral allocation of labour stabilises and, ceteris paribus, P

[4]As in Yasuoka and Miyake (2010), this assumption excludes two additional household types: one where women work in the goods sector and do not purchase child care, the other where women work in child care and purchase child care.

increases with rising $w^m(k)$ and $w^f(k)$.

Remark 2 *Fertility of a household using child care rises with female relative wages, for an endogenously increasing price of child-care.*

From (4b) and (9),

$$\frac{\partial n^y}{\partial\left(w^m / w^f\right)} = \frac{-\varphi\rho\gamma}{(1-\varphi)(1-m)} < 0 \tag{10}$$

where φ is constant in equilibrium.

The intuitive explanation for a rise in fertility of households purchasing child care as female relative wages rise lies in the market influences on the price of child care. From (9), if female relative wages $\left(w^f / w^m\right)$ rise, then the equilibrium price of child care rises proportionately less than household income $(w^m + w^f)$. Demand for child care shifts out with rising household income. Supply of child care also shifts out with rising female relative wages, because of the reduced fertility and increased labour supply of child care workers. An increase in $(w^m + w^f)$ has a positive income effect on the demand for fertility of households purchasing child care. This flows through to the market for child care, driving up the price. A rise in $\left(w^f / w^m\right)$ has a positive substitution effect on the supply of labour for women working in child care. With this supply effect, the rise in the child care price will be proportionately less than the rise in household income and the fertility of households purchasing child care rises.

Remark 3 *Overall fertility in the economy rises with female relative wages if productivity in the child care sector is sufficiently high.*

The overall fertility of the economy is a weighted average of the fertility of households using child care and maternal time. From (4a) and (4b), overall fertility rises with female relative wages for a sufficiently high ρ :

$$\frac{\partial f}{\partial\left(w^m / w^f\right)} = \frac{\varphi}{(1-m)}\gamma\left(\frac{1}{\hat{z}} - \rho\right) < 0 \text{ iff } \rho > \frac{1}{\hat{z}}$$

Intuitively, the fertility of women working in child care and final goods sectors falls and rises, respectively, as female relative wages rise. Whether overall fertility rises or falls depends on the relative weight attached to differential fertility responses. A relatively high ρ implies a relatively lower price of child care, giving a higher weight to the fertility rise of households working in the final goods sector.

IV Female Relative Wages

Cigno and Rosati (1996) show that the decline in fertility up until 1990 corresponded to a steady rise in the female-male wage ratio in the United States, United Kingdom, Germany and Italy. Since 1990, female wages have continued to rise relative to male wages in most OECD economies (ILO, 2010). In Japan, female relative wages rose until recently. Between 1989 and 1999, Japan's female-male wage ratio rose from 56 per cent to 66 per cent (Ministry of Health, Labour and Welfare, 2010). However, Figure 5 reveals that, since 1999, female hourly wages have grown broadly in line with male hourly wages.

If female relative wages are constant, then the results of the analysis in this paper indicate that neither fertility of households using child care, nor overall fertility in the economy will rise, under endogenously determined child care prices. These findings are consistent with the bottoming out of fertility in Japan.

[Figure 5 about here]

Endogenous fertility models have various mechanisms which link rising female relative wages to economic growth. Galor and Weil (1996), Doepke et al (2007) and Greenwood et al (2005) attribute differential productivity in the labour market to innate differences between men and women. Ex-ante gender differences explain why only women devote time to unpaid work, such as child rearing. Most widely used is the Galor and Weil (1996) assumption that men are endowed with skilled labour and physical labour (brains and brawn), whereas women are endowed only with brains. As physical capital accumulates, the marginal product of skilled labour rises and female wages rise proportionately more than do male wages. Economic growth causes female relative wages to rise. However, this is at odds with the following

Observation 3 Despite economic growth, Japanese female relative wages have remained relatively constant over the last decade.

Why then does a gender wage gap persist in Japan? Women and men may be similarly endowed in terms of skilled labour when they graduate and, consistent with Galor and Weil (1996), jobs requiring brute force are most likely male dominated, but do skilled men and women work with the same capital in the workforce? How capital is allocated between men and women may hold the key to the persistence of a gender wage gap.

To see this, consider a production technology with separability, first used by Galor and Weil (1996) to capture the relative rise in rewards to female labour brought about by economic growth. The production function is given by

$$Y = A\left(K^{\alpha}\left(L^{s}\right)^{1-\alpha} + bL^{u}\right) \tag{11}$$

where K, L^{s} and L^{u} denote capital, skilled labour and unskilled labour,

respectively. Men are endowed with one unit of skilled labour and one unit of unskilled labour. Women are allocated with one unit of skilled labour, which is allocated between child rearing and labour force participation.

Perfectly competitive labour markets imply

$$w_f^s = A(1-\alpha)\left(\frac{k}{1-z}\right)^{\alpha} \tag{12a}$$

$$w_m^s = A(1-\alpha)k^{\alpha} \tag{12b}$$

$$w_m^u = Ab \tag{12c}$$

where k is capital per household and z is total maternal time spent rearing children. The assumption that men and women are endowed with equal amounts of skilled labour, while only men are endowed with unskilled labour, yields two predictions. First, there is a gender wage gap: $w_m^s + w_m^u > w_f^s$. Second, economic growth closes the gender wage gap. Over time, both male and female wages grow with capital accumulation, however, male wages grow proportionately less:

$$\frac{w_m^s + w_m^u}{w_f^s} = (1-z)^{\alpha}\left[1 + \frac{b}{A(1-\alpha)}k^{-\alpha}\right] \tag{13}$$

where $\partial\left(\frac{w_m^s + w_m^u}{w_f^s}\right)/\partial k < 0$.

An implicit assumption underlying (13) is that men and women work with the same capital per household. Consider the case where men and women work with different amounts of capital, k_m and k_f. The gender wage gap is now

$$\frac{w_m^s + w_m^u}{w_f^s} = (1-z)^{\alpha}\left[\left(\frac{k_m}{k_f}\right)^{\alpha} + \frac{b}{A(1-\alpha)}k_f^{-\alpha}\right] \tag{14}$$

where $\partial\left(\frac{w_m^s + w_m^u}{w_f^s}\right)/\partial k_f < 0$ and $\partial\left(\frac{w_m^s + w_m^u}{w_f^s}\right)/\partial k_m > 0$. An increase in the ratio k_m / k_f raises male relative wages, countering the negative effect of increasing k_f. Thus, the effect of economic growth on the female relative wages is no longer unambiguously positive, yielding the following

Remark 4 *If men work with increasing capital relative to women, then capital accumulation need not close the gender wage gap.*

Many Japanese firms have a lifetime employment system (LES) which may provide incentives for men to work with increasing capital relative to women. First, patriarchy is strongest in older generations, who remain in decision making positions. Second, investment in the human capital is confined to workers who put in long hours and who are likely to have uninterrupted careers. Third, because the LES avoids dismissal, firms adjust labour input by adjusting working hours. Overtime is therefore necessary under usual economic conditions. Married women may be unable to provide long working hours due to gender inequity in housework.

As a consequence, to date, women may have found it difficult to reach positions where they can acquire high levels of capital and influence the allocation of capital. Referring to Figure 6, Japan and Korea are indeed clear OECD outliers in the portion of women in senior positions. Currently, in Japan, only 10 per cent of senior positions are held by women. There is room for more women at the top and, looking forward, reason to expect that women will break the glass ceiling. For instance, in 1990, 1 per cent of total parliamentary seats were held by women. By 2010, this figure had risen to 11 per cent (World Bank, 2011). The number of women in positions of influence in Japan may be low relative to other high income OECD countries, but it has risen from a low base.

[Figure 6 about here]

Conclusion

The once negative association between fertility and per capita income has become positive for OECD economies with high levels of per capita income. There are some noteable exceptions. Countries such as Japan and Korea, with the lowest female relative wages also have the lowest fertility.

This paper analyses the effects of female relative wages on fertility in a model that incorporates a child care services market. In contrast to the existing literature, endogenous increases in the price of child care and gender equity in the allocation of capital play important roles in the effect of female relative wages on fertility and the effect of economic growth on female relative wages, respectively. The analysis predicts that:

- As female relative wages rise, the equilibrium price of child care rises less than proportionate to household income. Consequently, fertility of households using child care rises.
- Overall fertility, which includes households who use maternal time to rear children, may rise with female relative wages if productivity in the child care sector is sufficiently high.
- Growth in per capita output may not filter through to higher female relative wages if men work with increasing capital relative to women.

For an endogenously increasing price of child care, the fertility of households using child care and maternal time, rises and falls, respectively, with female relative wages. Overall fertility rises if the rise in fertility of households using child care dominates. This in turn depends on a relatively low cost, high productivity child care sector.

The results in this paper suggest that the emerging positive association between fertility and per capita income is not robust. Firstly, economic growth may not filter through to rising female relative wages if capital is inequitably allocated in the workforce. Secondly, whether rising female relative wages can sustain a fertility upturn depends on the relative productivity of the child care sector.

Some interesting implications arise. More equitable allocation of capital between male and female skilled workers may hold the key to a fertility upturn in Japan, where female relative wages have levelled off over the past decade. We may also expect a positive association between fertility and female relative wages to continue in countries with well established and productive child care sectors. There is cause for optimism about the future course of Japanese fertility. Japan has the vantage of being able to catch up with respect to the number of women in senior positions and to appreciate the importance of affordable child care in sustaining a fertility rebound.

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Figure 1: Total Fertility Rate (births per woman)

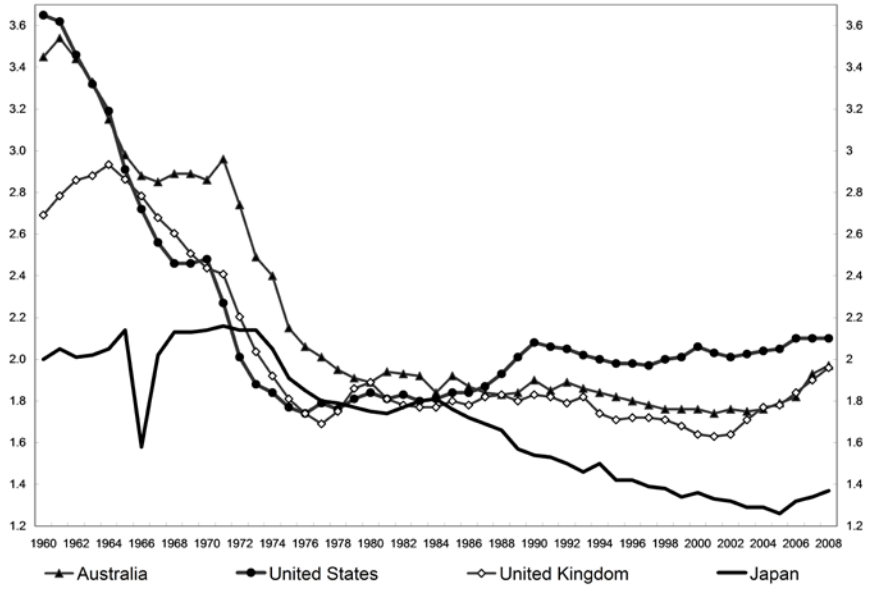


Figure 2: Total Fertility Rate (vertical) versus GDP per capita, PPP (constant 2005 international $) (horizontal), OECD, 1980-1984

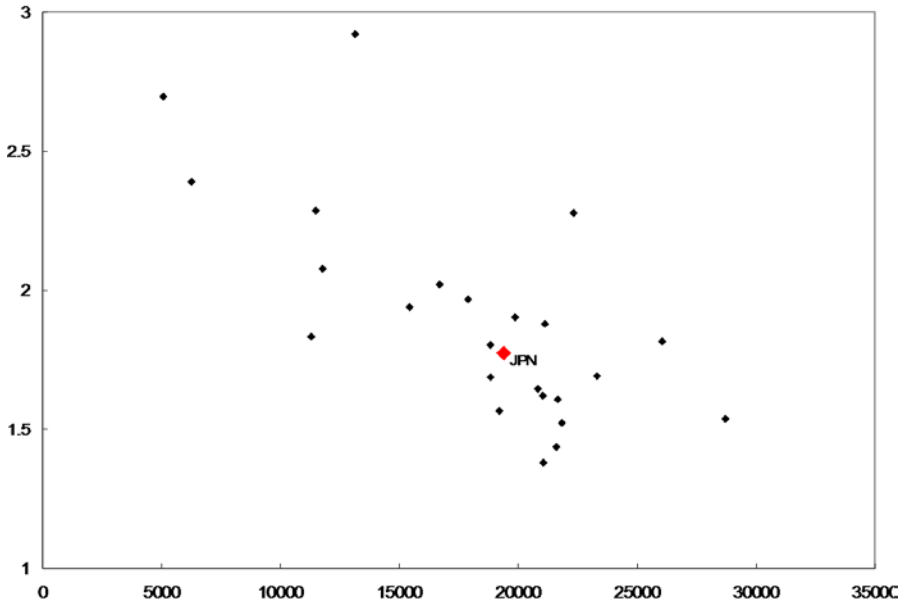


Figure 3: Total Fertility Rate (vertical) versus GDP per capita, PPP (constant 2005 international $) (horizontal), OECD, 2005-2009

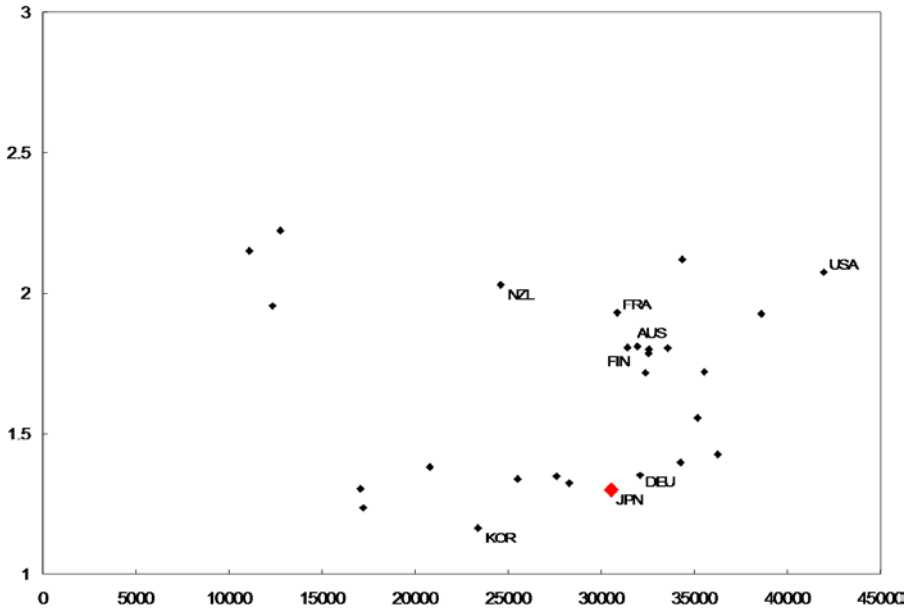


Figure 4: Gender Wage Gap for 22 OECD economies, 2006

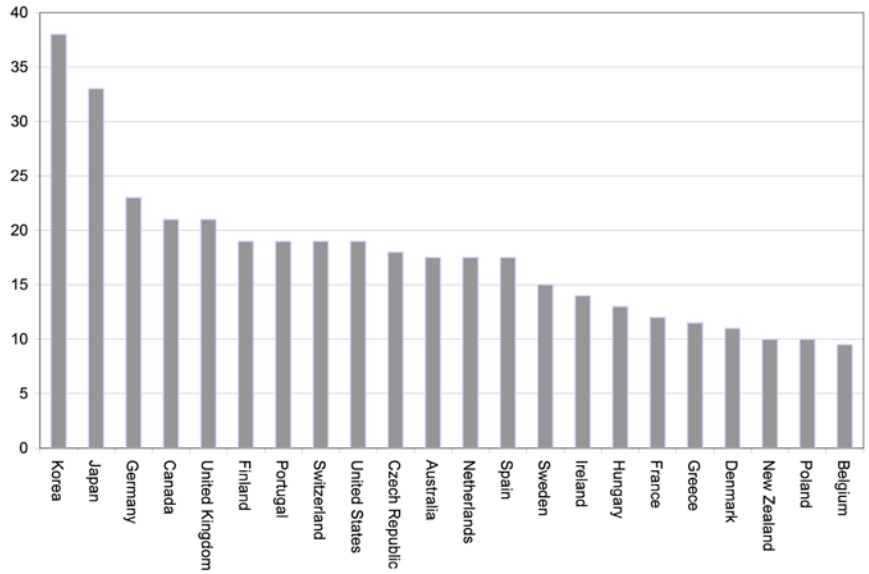


Figure 5: Japanese Female and Male Hourly Wages, 1999-2009

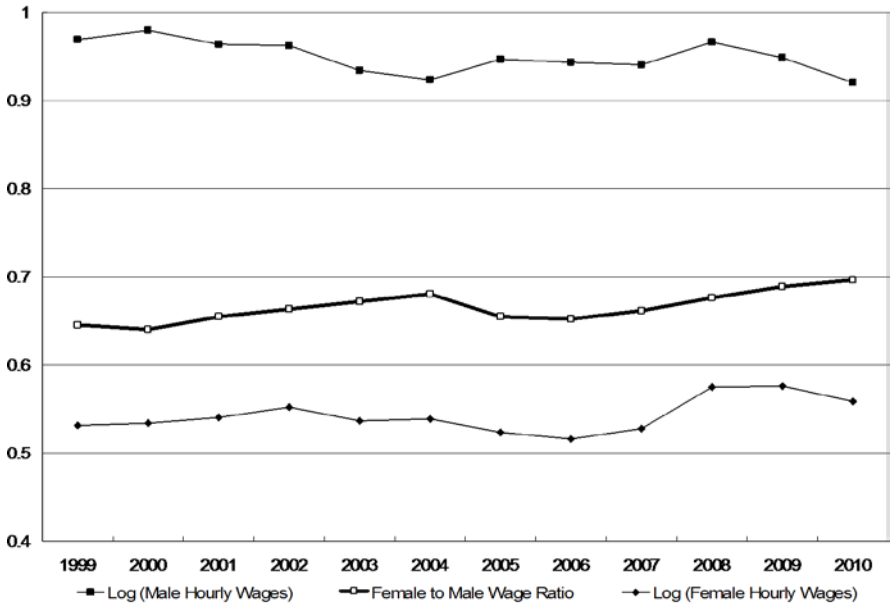
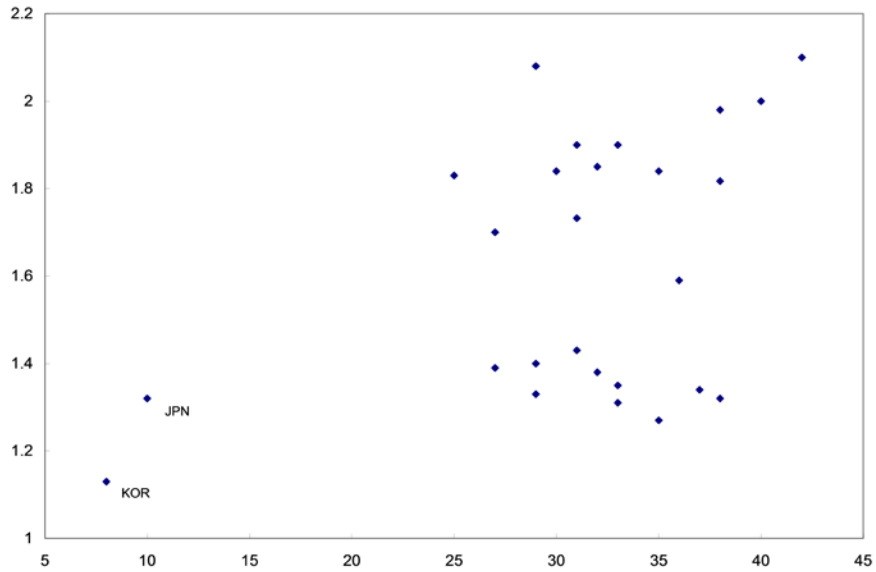


Figure 6: Total Fertility Rate (LHS) versus Female Legislators, Senior Officials and Managers as a percent of total (RHS), OECD, 2007



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